

Johnson spoke of his studies of some Diptera as follows: The results of my recent study of the genus *Stratiomyia* may be summarized as follows: the number of species in Osten Sacken's catalogue recorded north of Mexico is twenty-nine; to this number Bigot has since added six, a total of thirty-five. Of these fourteen have been reduced to synonymy, six remain unidentified, one has been referred to a new genus, and two new species have been described. This leaves for our consideration sixteen species; these are divided into three groups, the first *Stratiomyia*, *s. str.*, contains five species; the second, *Thereodonta*, two; and the third, *Normula*, nine. The color pattern is still largely used in distinguishing species, but in almost every case the male and female have both been studied.

Dr. Horn stated that his paper on *Scymnus* was nearly completed, and that he hoped to present it at the next meeting. Mr. Calvert quoted from Dr. Riley's presidential address to the Ent. Society of Washington of February, 1894, that no species of Odonata habitually hibernated, and stated that *Symphyna fusca* has been found to regularly pass the Winter in the imago state, in numbers, in France.

Dr. HENRY SKINNER, *Recorder*.

The following papers were read and accepted by the Committee for publication in ENTOMOLOGICAL NEWS:

Preparatory stages of *Phlegethontius cingulata*.

By HARRISON G. DYAR.

I find that the life-history of this *Sphinx* has not been written. The larvæ occurred commonly on morning-glory vines near Honolulu, Hawaiian Islands.

Egg.—Elliptical, nearly spherical, not flattened; smooth, shining, nearly colorless and translucent, with a greenish tinge; size 1.3 x 1.1 x 1.1 mm. Under a half inch objective the surface is smooth, shining, covered with circular shallow pits of varying size and irregularly distributed. Found on a leaf of *Ipomœa tuberculata* Roem. and Sch.

First stage.—On hatching, entirely white, with a black horn. Head rounded, not shining, pale greenish yellow, mouth a little darker, ocelli brown; width .55 mm. Body cylindrical, smooth, shining, distinctly annulated, uniform whitish, the food giving a dark green shade by transparency. A faint, narrow, white subdorsal line ending at the horn. Horn straight, thick, blunt at the end, black and minutely setose, its length 1.5 mm.

Second stage.—Head rounded, pale green, with many white setiferous granulations; ocelli black; width 1 mm. Body granular, the granules setiferous, white; color pale green; caudal horn black spinose, tapering, 2.5 mm. long.

Third stage (dimorphic).—Head rounded, green, with conical white granulations; a faint yellowish line runs up before the ocelli, in the brown form followed by a black shade posteriorly; width 1.8 mm. Body cylindrical, annulated, covered with white granulations; a very faint subdorsal line and indications of the seven oblique lateral lines, in the brown form preceded by black shades; spiracles surrounded by black and similarly colored marks on all the feet; spiracles ocherous.

Fourth stage.—Head uniform light green, thickly covered with small, round, white tubercles; a vertical whitish line before the black ocelli, width 3.2 mm. Body roughened with many white granulations like those on the head, more elongated on the caudal horn and bearing there minute setæ; color green, with a whitish shading and seven oblique lateral lines on joints 5-11, the last produced over joint 12 to the base of the horn, the others reaching from before the spiracle to subdorsal region, but continued back on the succeeding segment by a faint white shade. Lines pale yellow, preceded by a bright green shade and marked centrally by a small dash of light purple. Horn green, yellow at tip; thoracic feet red-brown; spiracles rusty brown, bordered narrowly with ocher.

Fifth stage (green form).—Head higher than wide, rounded, flat in front, smooth, shagreened; leaf green, with a broad, black, vertical band on each side covering the ocelli, which it just encloses by its well-defined anterior border; before it the ground color assumes a yellowish tint and preceding this yellowish shade is a faint, blackish clouded band; width 6 mm. Body plump and robust, the segments annulated; head slightly retracted below joint 2, and joint 2 below joint 3; but body elsewhere of uniform size. Horn large, tapering, curved backward, covered with short tubercles which bear very minute setæ. Body smooth, colored leaf green, a little mottled with whitish, with the following purplish brown mottled marks: a patch covering the thoracic feet and their bases; an oblique, subventral patch on joint 6 analogous to the marks covering the abdominal feet, each of which extends upward and forward obliquely in a broad band, ending at the anterior border of the segment; the one covering the anal foot extends along subventrally to the anterior edge of joint 11; sub-anal plate green, contrasting with the nearly black bases of the feet, bordered above by a faint brown subdorsal shade; a broad, subdorsal band, enlarged centrally on each segment, begins behind the cervical shield, widens and sends out an arm obliquely forward and downward on joints 5-11, each of which ends at the anterior edge of the segment before the spiracle. The band narrows on joint 11 posteriorly and ends at the horn, which is colored blackish brown with small greenish tip. The lateral branches of the subdorsal band are edged posteriorly with white, representing the usual oblique stripes; spiracles black, with a linear ocherous border and central dividing line, those on joints 5-12 surrounded by a circular black patch, contiguous (except on joint 12) to the oblique lateral lines. Length about 115 mm.; of horn 7 mm.

(Brown form) Head flesh-brown; a vertical black stripe over ocelli and

another near clypeus; sutures and jaws black. Body flesh-brown, densely covered with small, rounded, purplish black, confluent spots, almost covering the surface. Feet, cervical shield and venter entirely purplish black; on joints 3 and 4 a broad dorsal and narrow subdorsal bright brown band. Lateral oblique lines indicated by heavier mottlings above and predominance of the ground color below; spiracles black, with orange-red and central line, surrounded by black.

Pupa.—Tongue case large, distant from the body, extending to near the middle of the cases then recurved along the body to near its origin, rounded and a little enlarged at the end; cremaster broad, flat, narrowing laterally and ending in four short spines; color bright mahogany-red, darker on tongue case, cremaster nearly black. Length 64 mm.; width of thorax 15 mm.; length of tongue case about 47 mm.; distance from origin to joint of recurvature 21 mm.; diameter of tongue case 2.5 mm.

THE COMPOUND EYE.

By E. BRENDL.

The anatomical and physiological comparison of the organ of vision is certainly a most difficult undertaking. Though the study of the eye of the vertebrate animals has progressed during the last century in an admirable way, notwithstanding there are left many obscure points which will perhaps never be elucidated. We do not know anything concerning the reversion of the image, nor the physiology of the cones, or bacillæ. The art of photography has helped us considerably in proving the law of vision. The momentary retention of an image by the exposure to the eye of a living vertebrate animal for the reception of the projection of an object on the retina has been proved in a chemical way by developing and fixing the image on the retina, demonstrating a physiological analogy of the photographic camera and the eye.

The image in the camera appears to us not convex, but as a geometrical projection, if the object is in all its parts equally illuminated, that is, shadeless. The presence of light and shade with its delicate gradation alone produce the imagination of rotundity in a rather defective way.

In the human eye the image is also plain when we use only one eye, but there are other additional factors than the shades of the object producing the perception of rotundity. There is our experience by touch assisting our eye—then the very defect of our vision, seeing sharply only such parts of the object which lie nearest to the optical axis is partly corrected by the combined use of our two eyes as each one receives an image from a different standpoint. The axes of vision of our eyes are convergent and adjustable. One eye sees parts of the object which the other cannot see; but the congruity of the images makes us in reality see more than the geometrical projection of the object on the single retina and corrects the flatness of the image. The photographer imitates nature by